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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/867,998

05/29/2001

Charles A. Shermer

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07/15/2002

WEISS & MOY PC
4204 NORTH BROWN AVENUE
SCOTTSDALE, AZ 85251

EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 07/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/867,998

Applicant(s)

SHERMER, CHARLES A.

Examiner

DiLinh Nguyen

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 24-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: section 14A (page 11, line 5) and section 14B (page 11, line 11).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 8-9, 11, 14 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (U.S. Pat. 6177725).

- Regarding claims 1, Yamada et al. disclose a semiconductor device (figs. 4a-5, column 5, lines 25 et seq.) comprising:

a lead frame 31;

a die 32 coupled to the lead frame;

at least one groove 38a (column 5, lines 30-32) formed in a top surface of the leadframe; and

a mold compound 36 for encapsulating the semiconductor assembly.

Yamada et al. disclose the claimed invention except for not specifically point out that the groove forming a lock between the mold compound and the leadframe. It would

have been obvious that the mold compound flows into and bonds with the groove forming a lock between the mold compound and the leadframe.

- Regarding claim 8, Yamada et al. disclose a semiconductor device (figs. 4a-5, column 5, lines 25 et seq.) comprising:
 - a lead frame 31;
 - at least one groove 38a (column 5, lines 30-32) formed in a top surface of the leadframe.
- Regarding claims 9 and 14, Yamada et al. disclose the lead frame 31; at least one groove 38a formed in a top surface of the leadframe; and a mold compound 36 for encapsulating the semiconductor assembly. It would have been obvious that at least one channel forms a lock between the leadframe and the mold compound which flows into the at least one channel.
- Regarding claim 24, Yamada et al. disclose a semiconductor device (figs. 4a-5, column 5, lines 25 et seq.) comprising:
 - a leadframe 31;
 - a die 32 coupled to the lead frame;
 - at least one groove 38a (column 5, lines 30-32) formed in a top surface of the leadframe; and
 - a mold compound 36 for encapsulating the semiconductor assembly.
 - at least one groove 38a (column 5, lines 30-32) formed in a top surface of the leadframe and means for forming a lock between the mold compound and the leadframe.

- Regarding claim 25, Yamada et al. disclose at least one groove 38a (column 5, lines 30-32) formed in a top surface of the leadframe and further is used for allowing the mold compound to flow into the groove and bond with the groove.
- Regarding claims 3 and 11, Yamada et al. disclose a plurality of grooves 38a formed in the top surface of the leadframe.

4. Claims 2, 4-7, 10, 12-13, 15 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (U.S. Pat. 6177725) in view of Nakamichi (U.S. Pat. 6127206).

- Regarding claims 4-7, 12-13 and 27-28, Yamada et al. disclose the claimed invention except for not point out that the grooves are triangle or U shaped and the grooves are formed by stamping and coining or etching.

Nakamichi discloses the lead 16 is formed with a groove 18, wherein the groove 18 has a "V" shaped in cross section (fig. 2, column 5, lines 1-5) and "U" shaped (fig. 5); and the groove is formed by coining or etching (column 6, lines 54-59) to increase the lead bonding strength and prevent the lead from being pulled out of the encapsulation (column 5, lines 12-15 and 6, lines 47-48). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Yamda et al. to increase the lead bonding strength and prevent the lead from being pulled out of the encapsulation, as shown by Nakamichi.

- Regarding claims 2, 10, 15 and 26, Nakamichi discloses a first raised area on the leadframe where the die is coupled; and a plurality of second raised areas on the leadframe used for wirebonds 24, wherein the plurality of second raised areas

Art Unit: 2814

allow the mold compound 32 to get underneath the wirebonds and capture the wirebonds (figs. 3-4, column 5, lines 12-16).

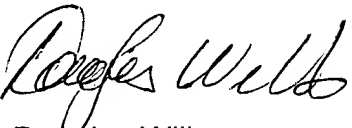
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, OLIK CHAUDHURI can be reached on (703) 308-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN
DiLinh Nguyen
July 12, 2002


Douglas Wille
Patent Examiner